FIG. 1

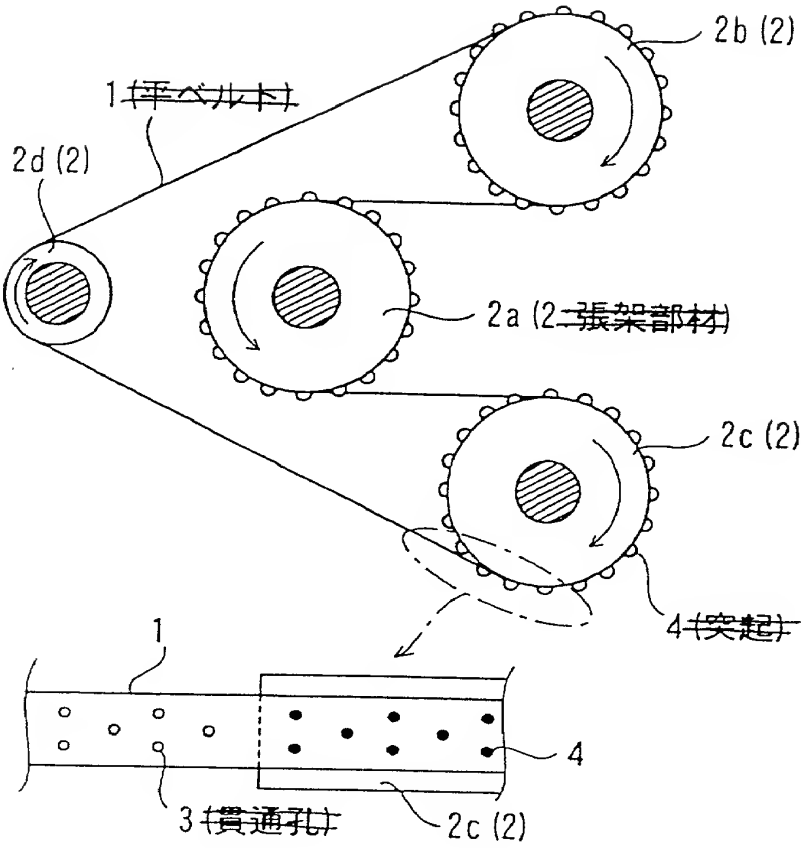


FIG. 2(a) ~~(a)~~

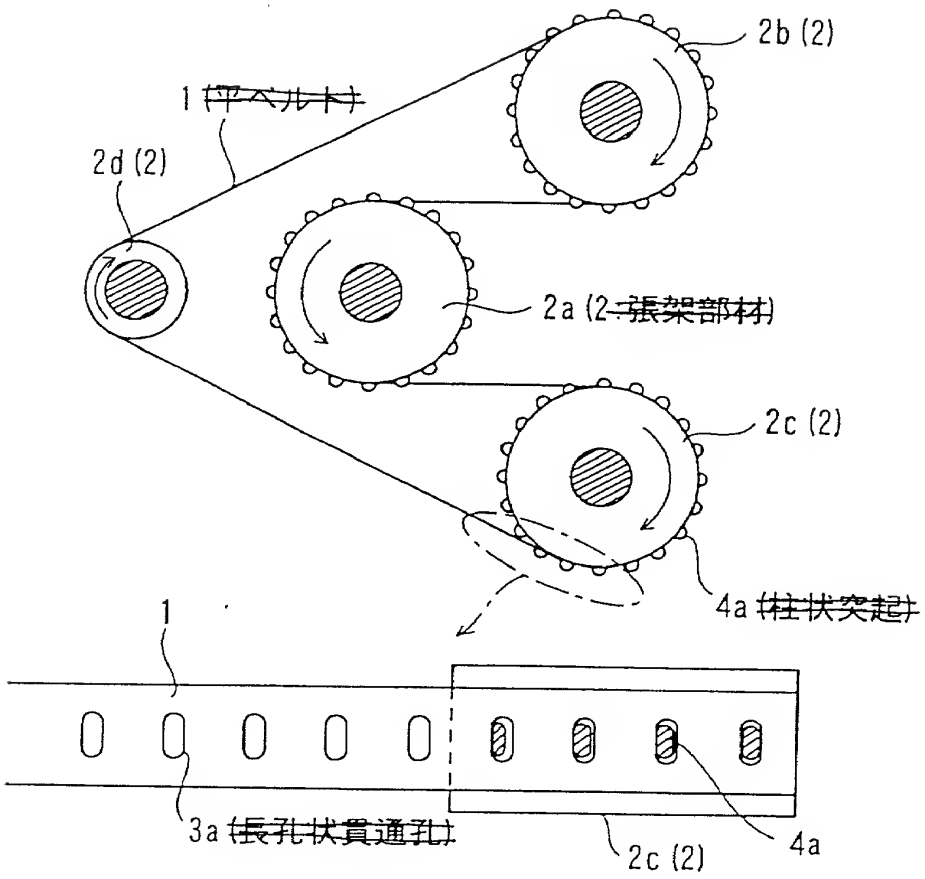


FIG. 2(b) ~~(b)~~

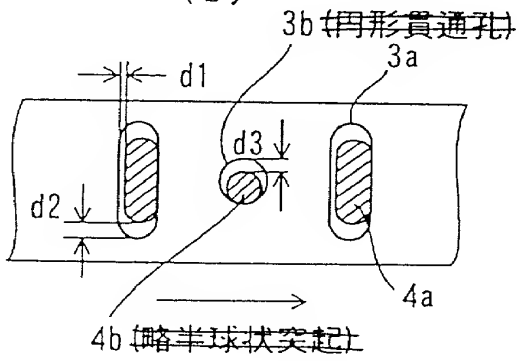
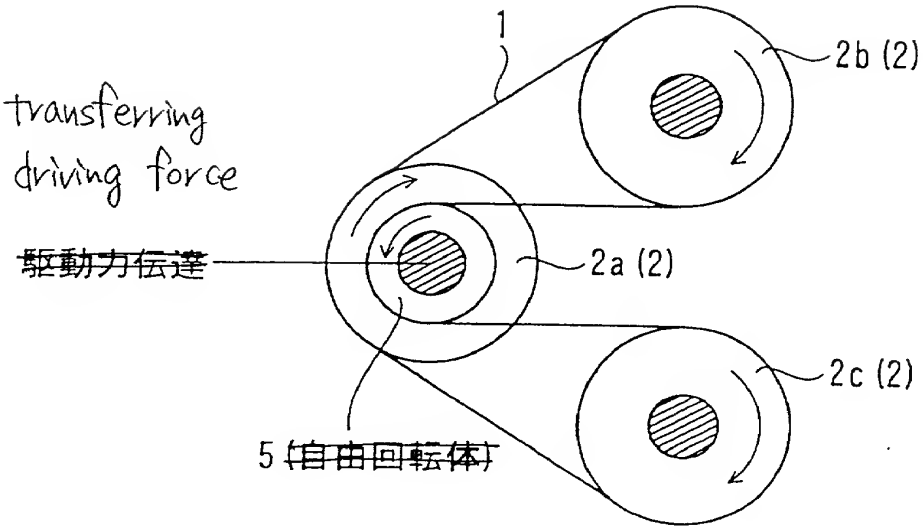


FIG. 3



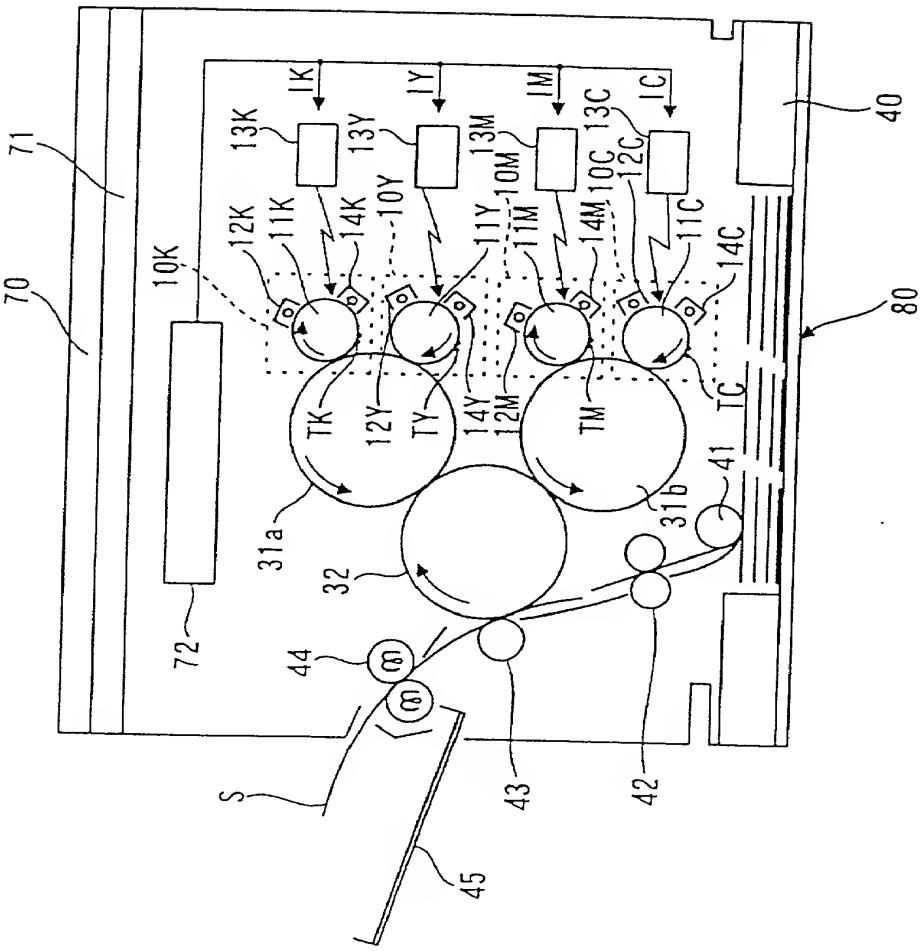

70
71
72
10K
12K
11K
14K
10Y
11Y
11M
14M
10C
12C
11C
14C
13K
13Y
13M
13C
1K
1Y
1M
1C
40
80
TK
12Y
TY
14Y
12M
TM
TC
31a
31b
32
41
44
43
42
S
45

FIG. 4

FIG. 5

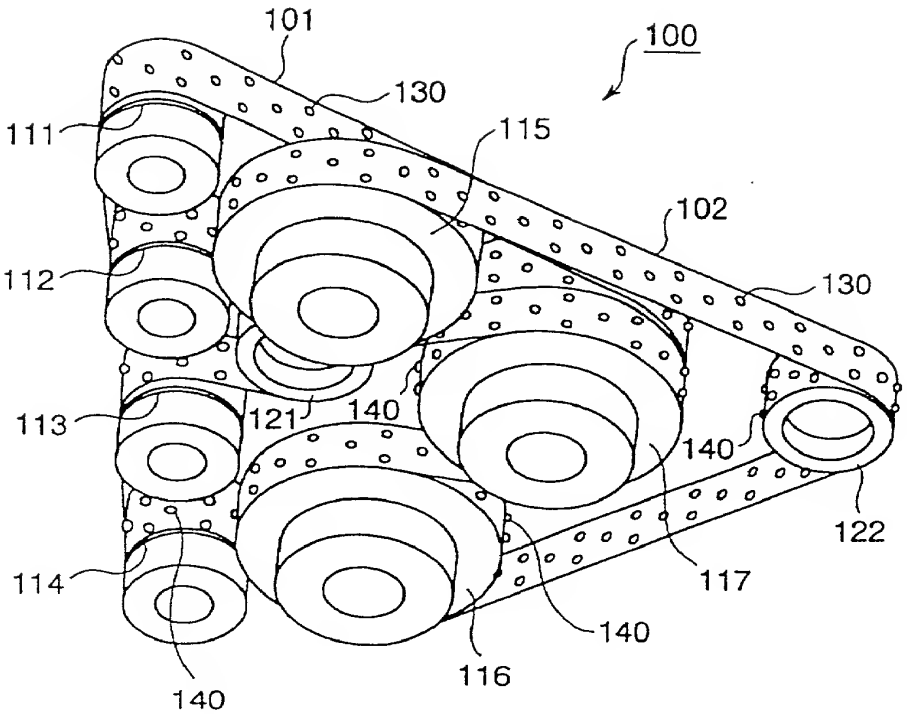

101
100
130
111
115
102
112
130
113
121
140
140
122
114
117
140
116
140

FIG. 6(a)

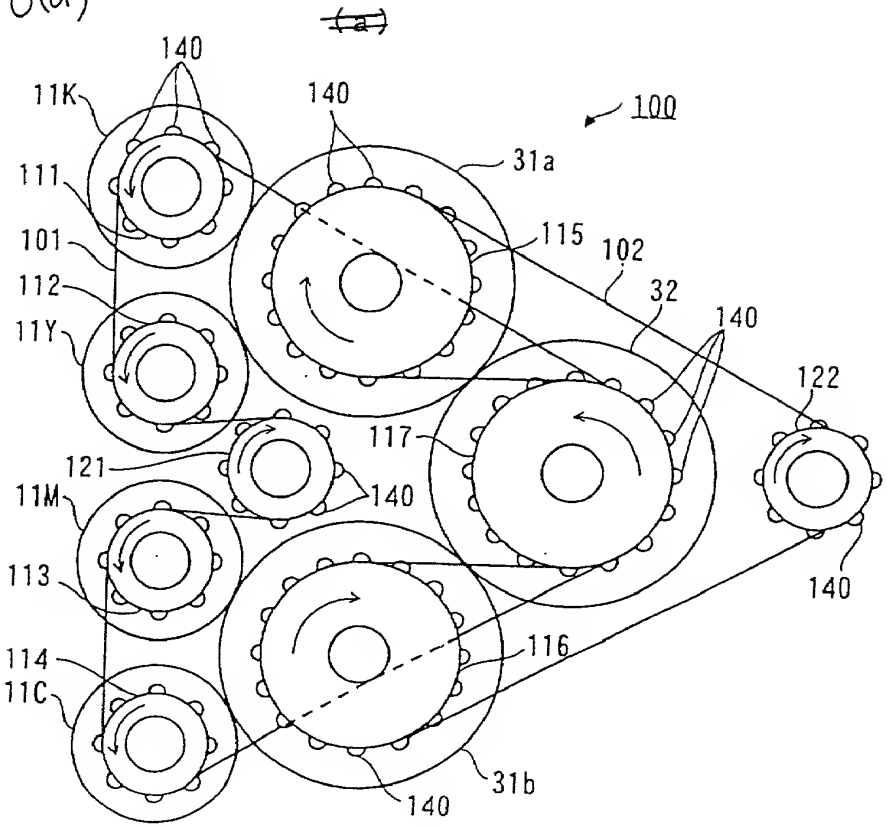

140
11K
140
100
31a
111
115
102
101
32
112
140
11Y
122
117
121
140
11M
113
140
116
114
11C
31b
140

FIG. 6(b)

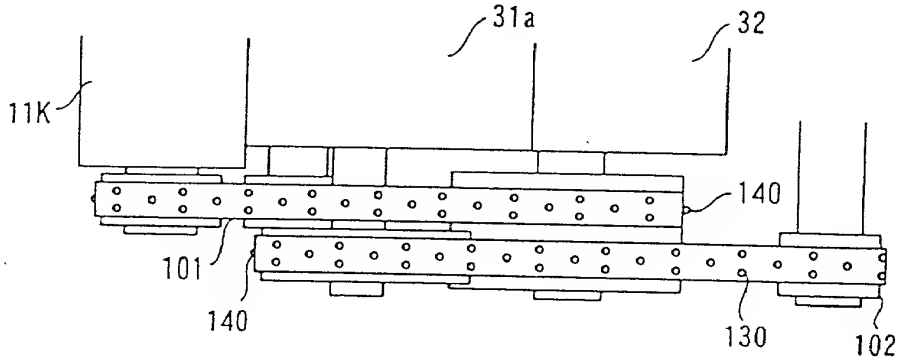
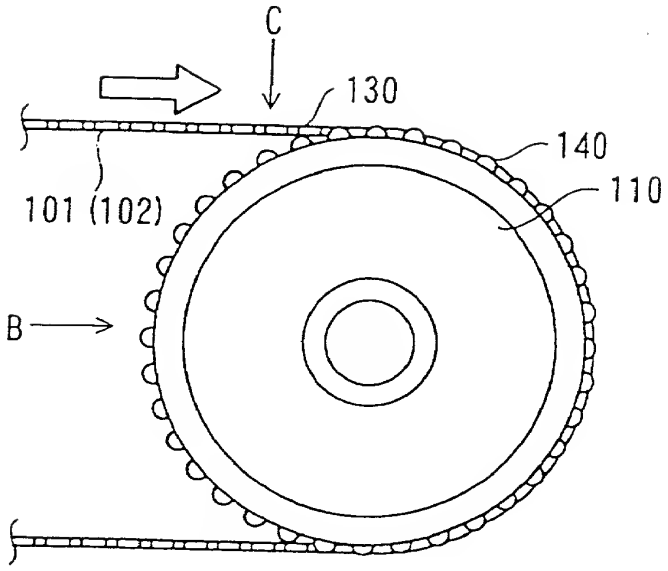
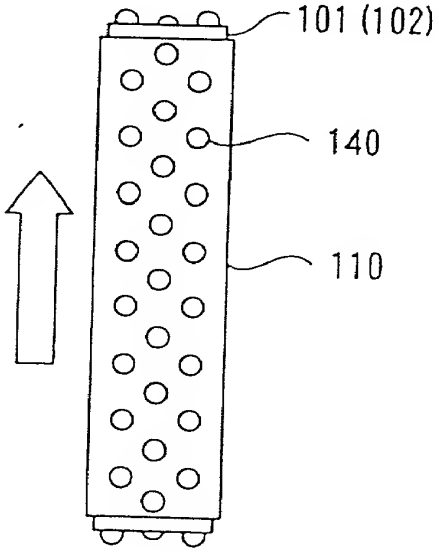

31a
32
11K
140
101
140
130
102

FIG. 7(a)



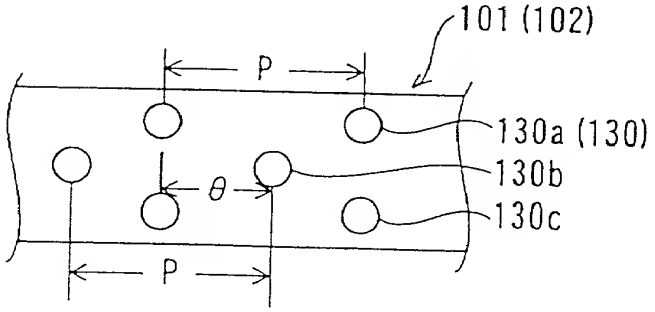
~~(a)~~

FIG. 7(b)



~~(b)~~

FIG. 7(c)



~~(c)~~

FIG. 8(a)

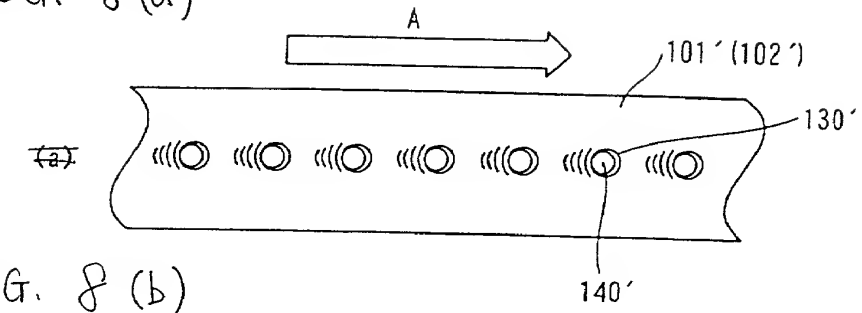


FIG. 8(b)

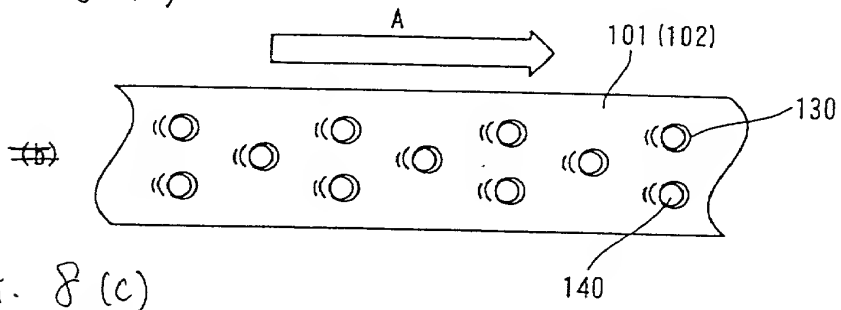
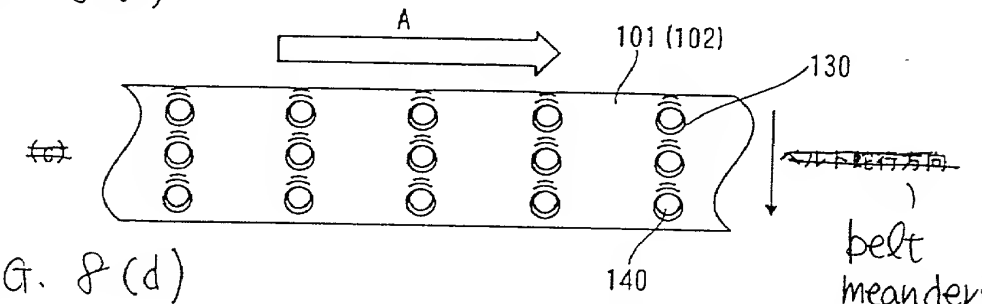


FIG. 8(c)



belt meandering direction

FIG. 8(d)

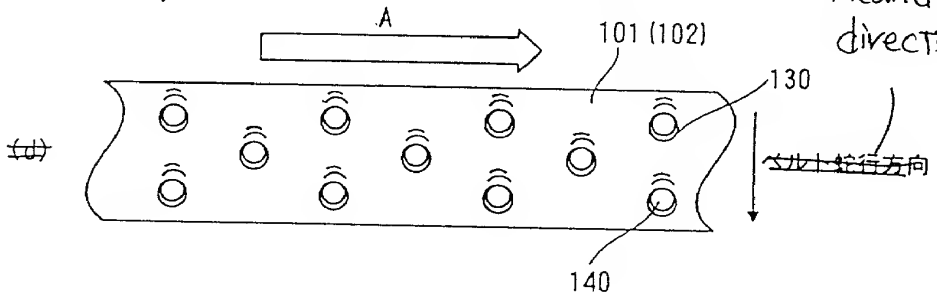


FIG. 9 (a)

~~(a)~~

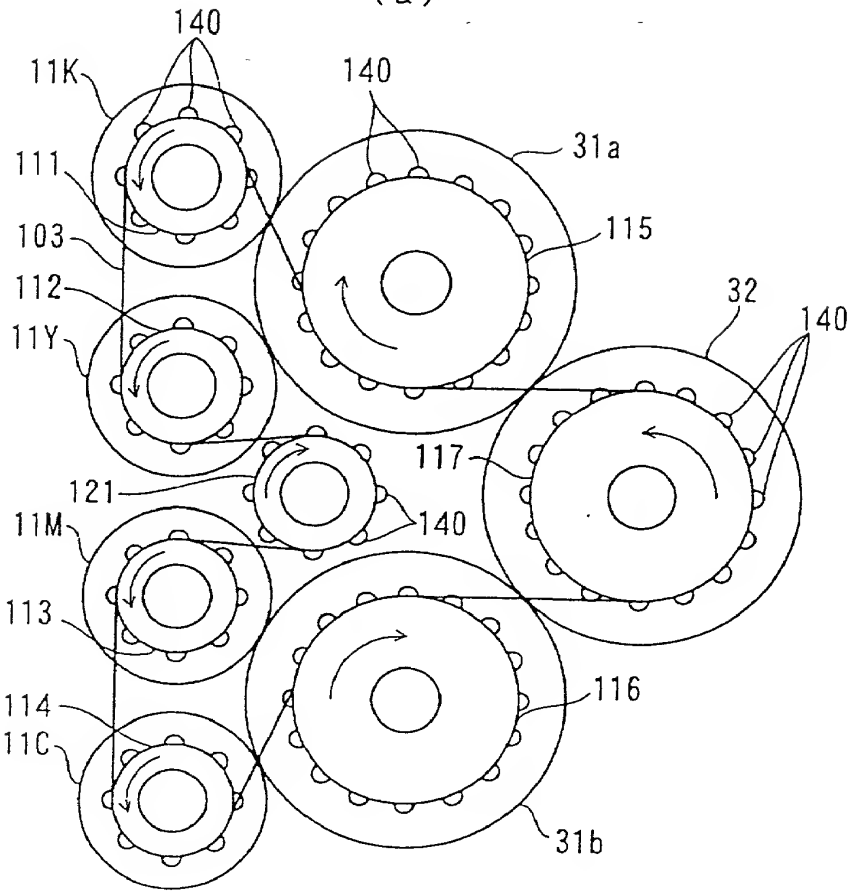


FIG. 9 (b)

~~(b)~~

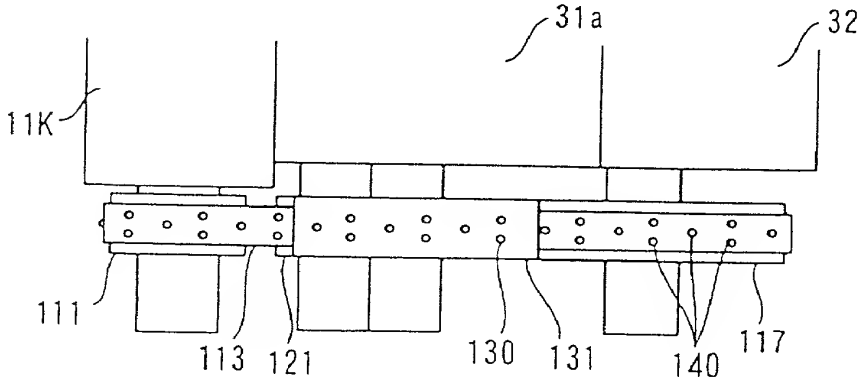


FIG. 10

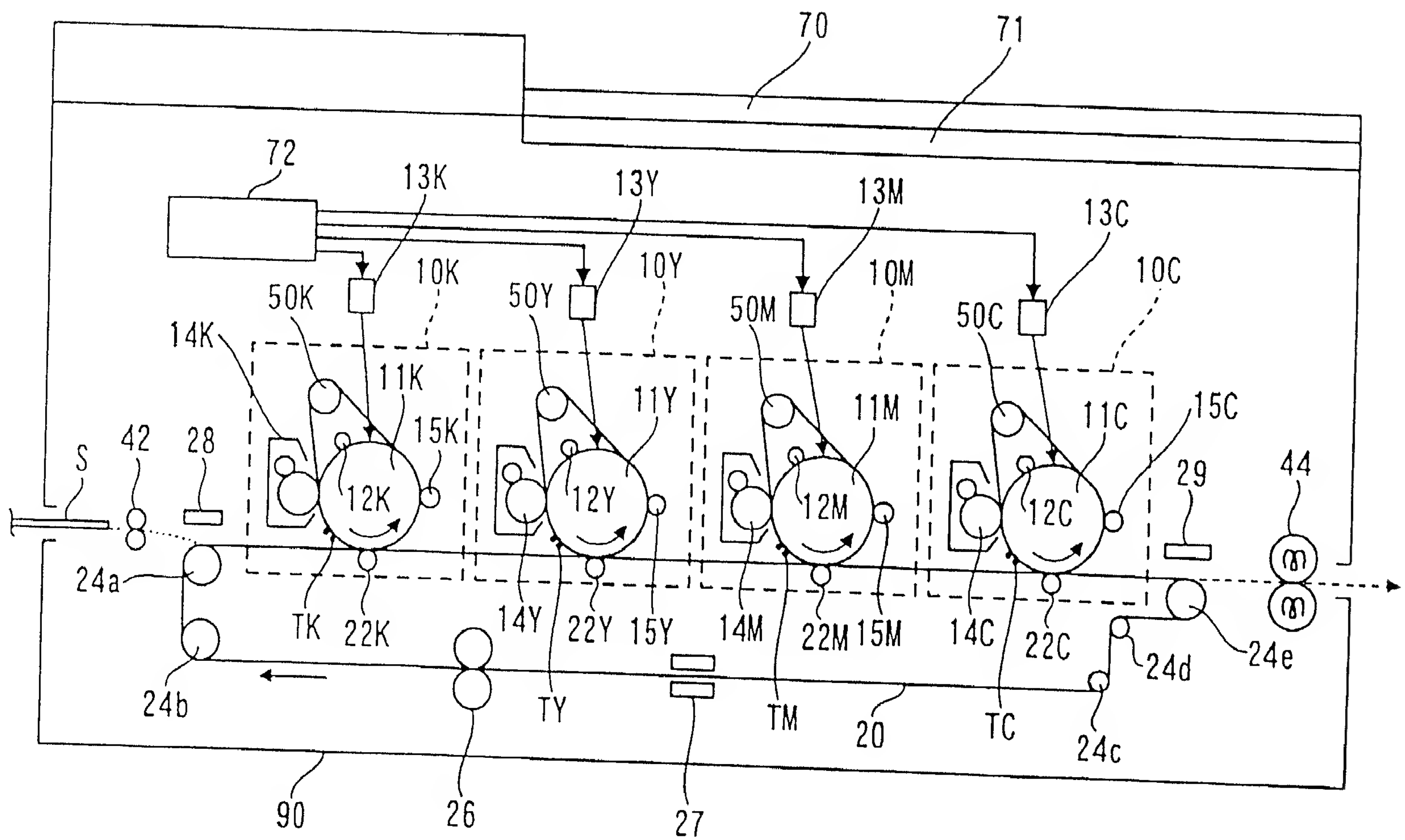

70
71
72
13K
13Y
13M
13C
10K
10Y
10M
10C
50K
50Y
50M
50C
14K
11K
11Y
11M
11C
15K
15C
12K
12Y
12M
12C
S
42
28
29
44
24a
24b
24c
24d
24e
TK
22K
14Y
22Y
15Y
14M
22M
15M
14C
22C
TY
TM
TC
20
90
26
27

FIG. 11(a) ~~(a)~~

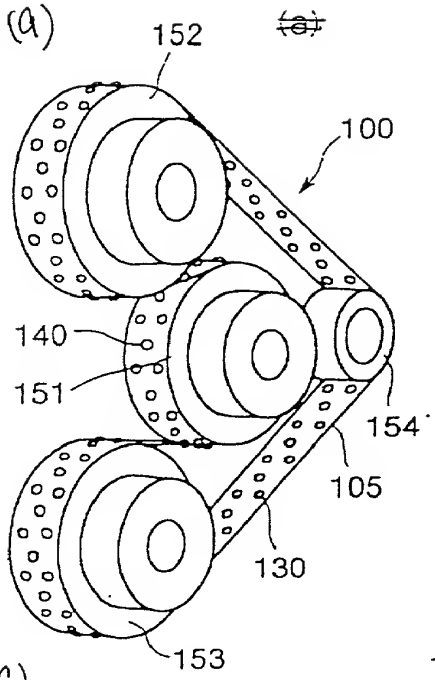


FIG. 11(b) ~~(b)~~

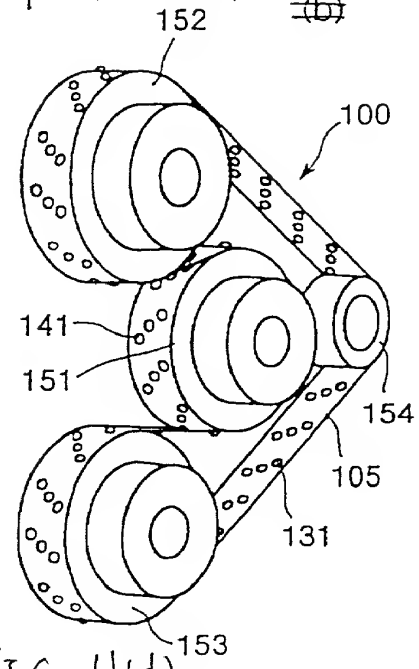


FIG. 11(c) ~~(c)~~

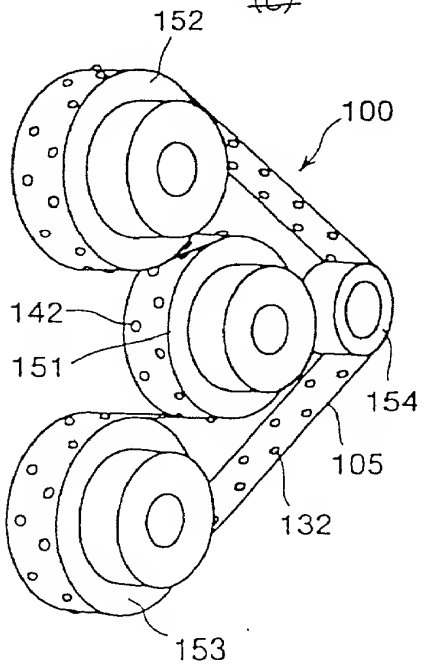


FIG. 11(d) ~~(d)~~

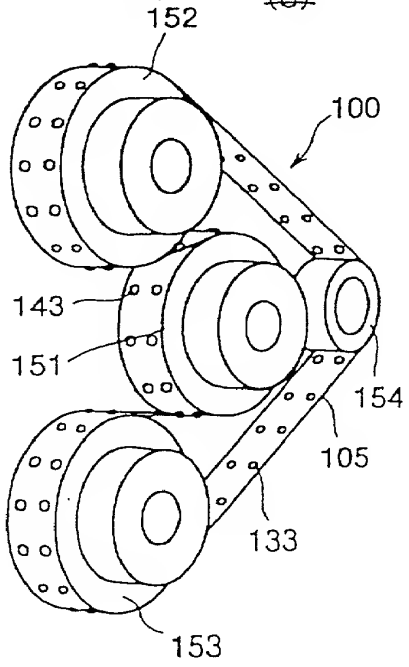


FIG. 12

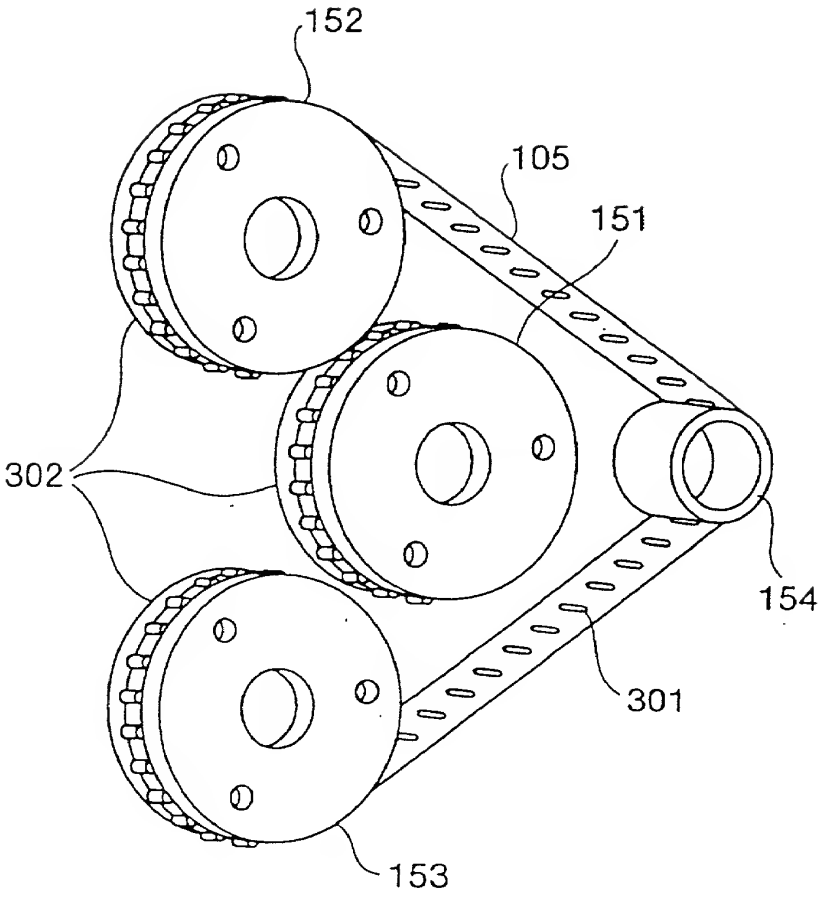


FIG. 13(a)

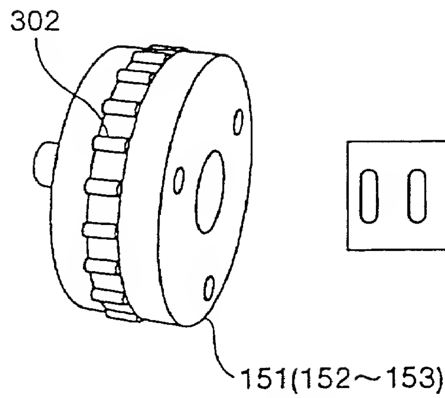


FIG. 13(b)

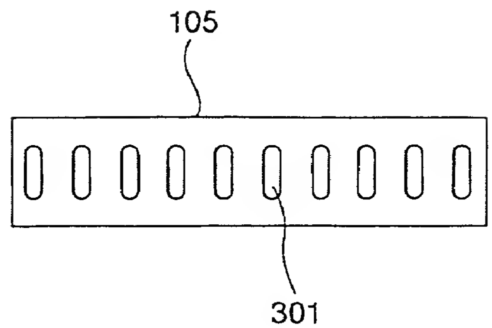


FIG. 13(c)

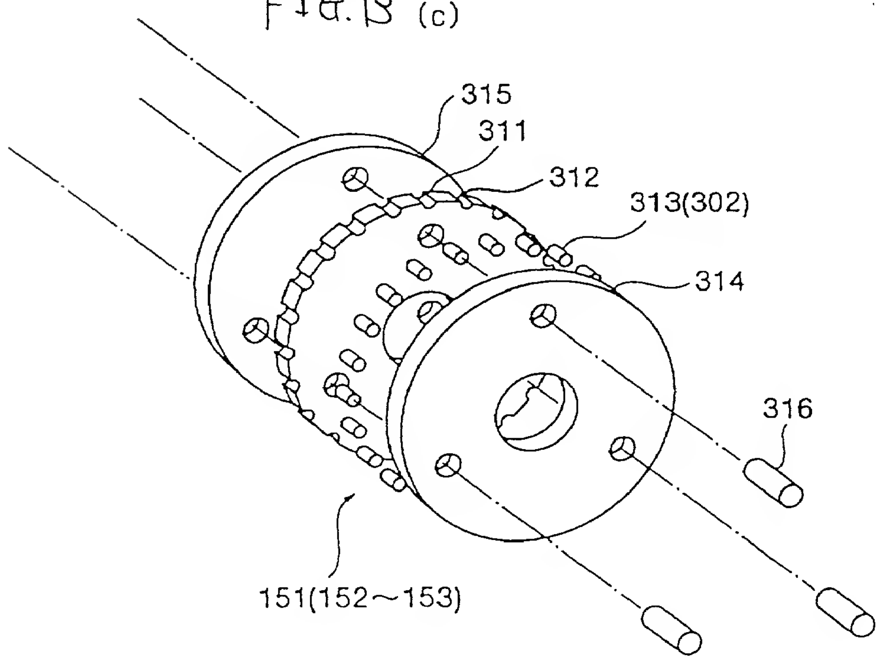


FIG. 14

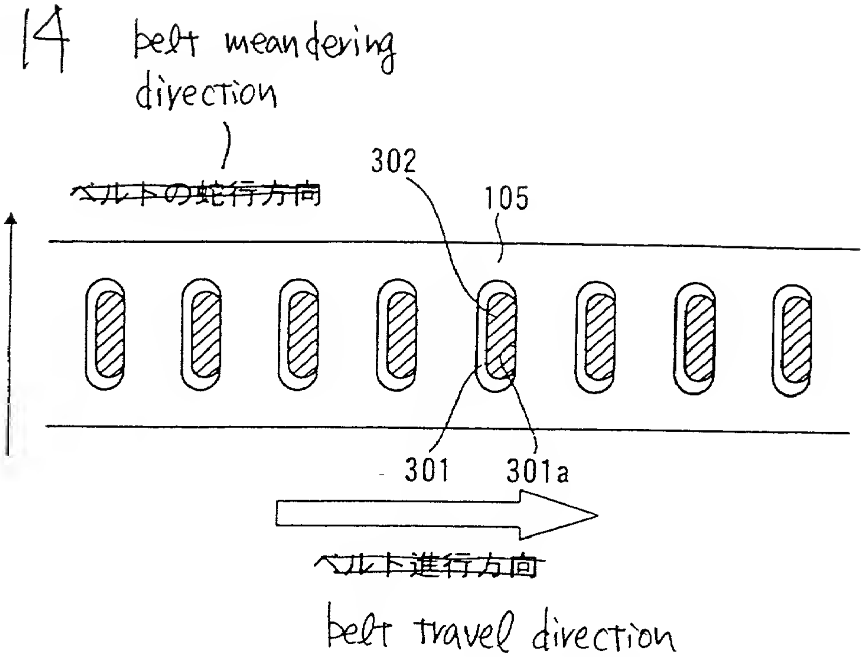


FIG. 15

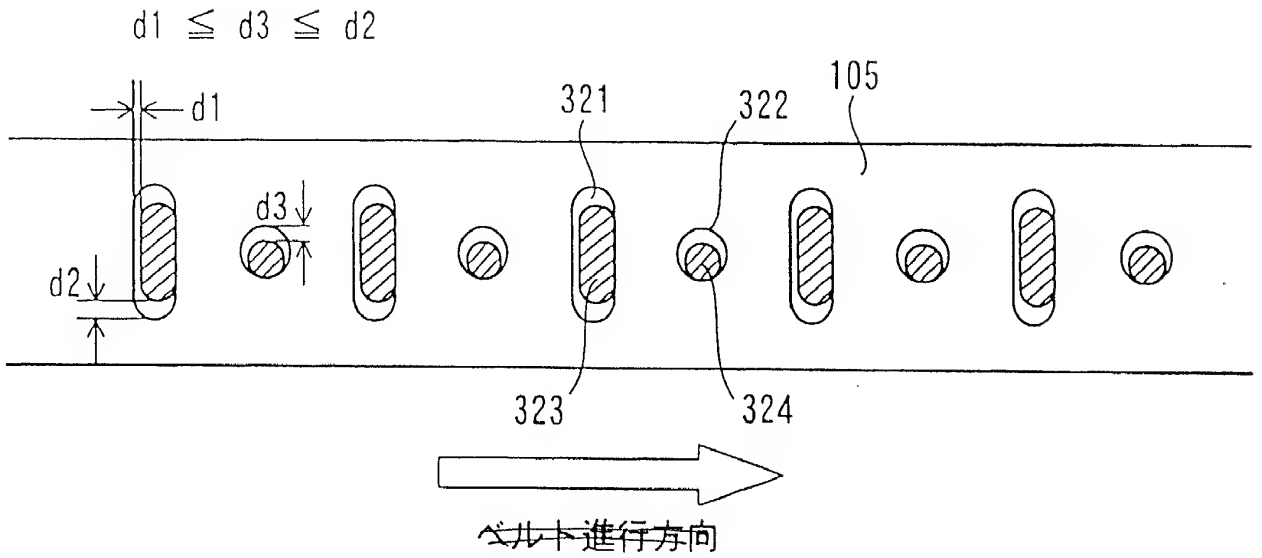

d1 ≦ d3 ≦ d2
d1
d2
d3
321
322
105
323
324
ベルト進行方向
belt travel direction

FIG. 16 (a)

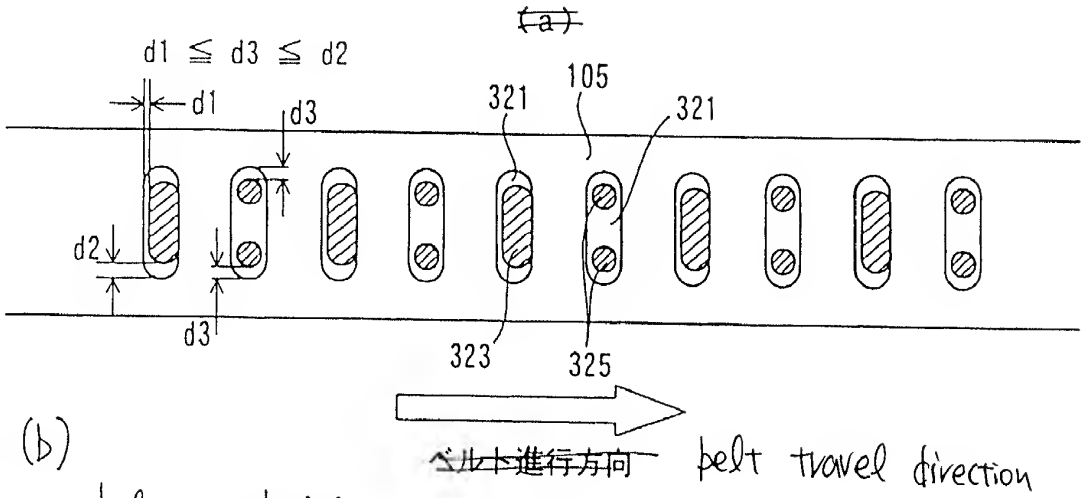


FIG. 16 (b)

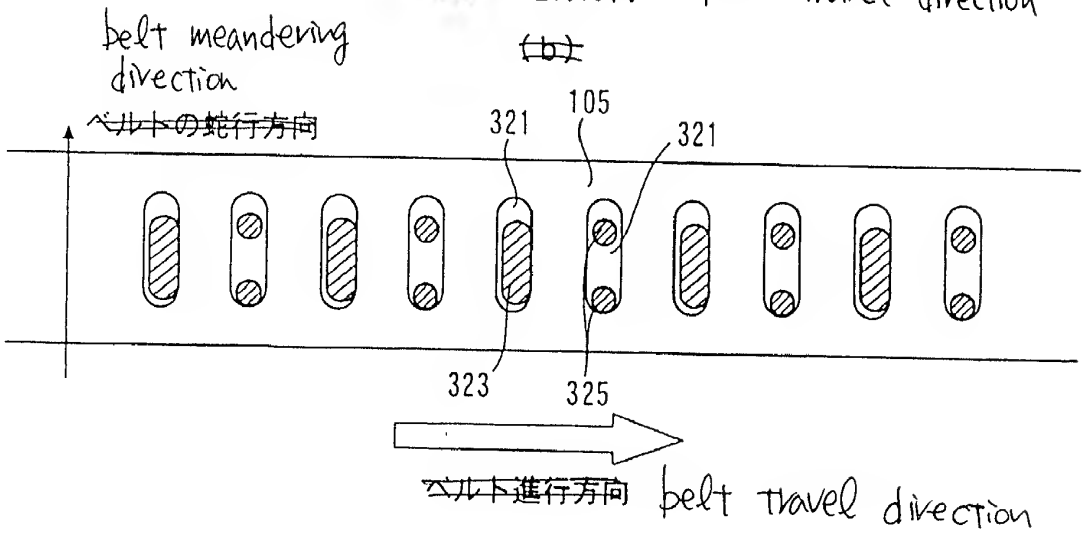


FIG. 17

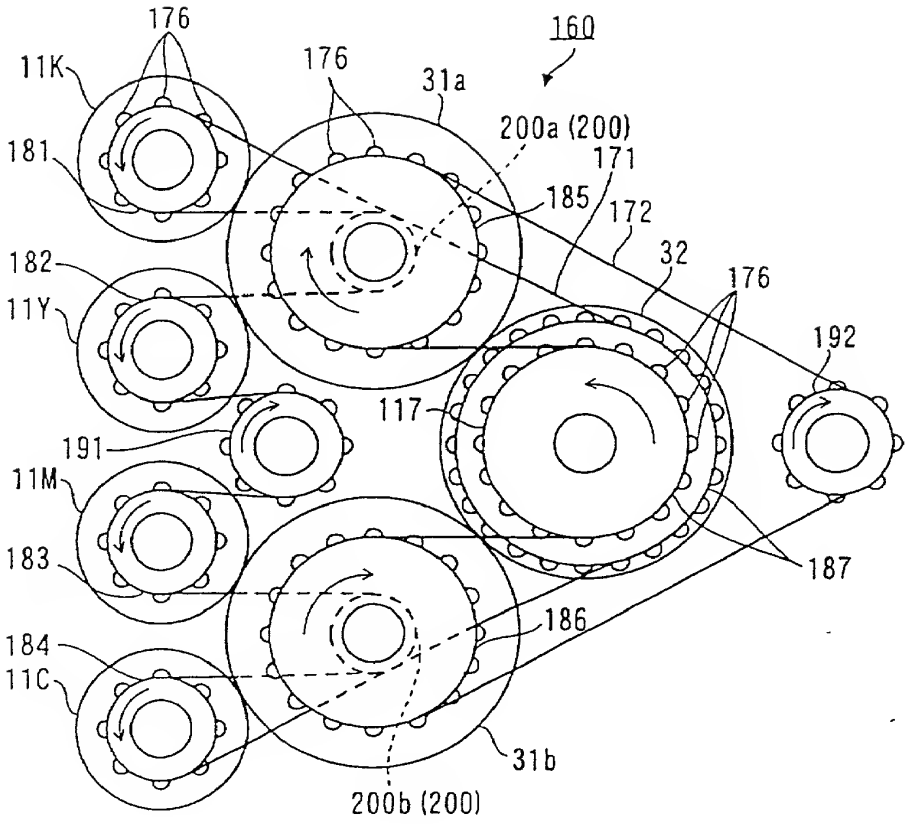

176
11K
176
160
31a
200a (200)
181
171
185
172
182
32
176
11Y
192
117
191
11M
187
183
186
184
11C
31b
200b (200)

FIG. 18

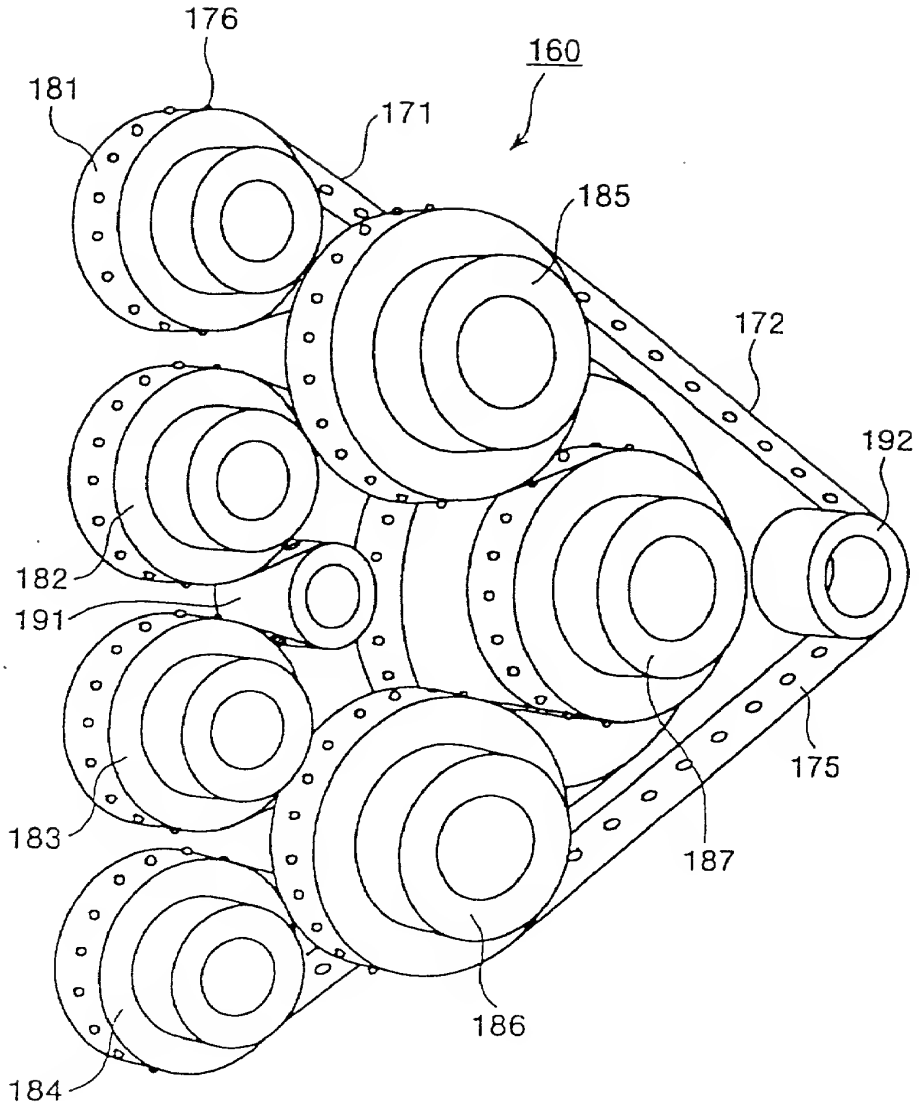


FIG. 19

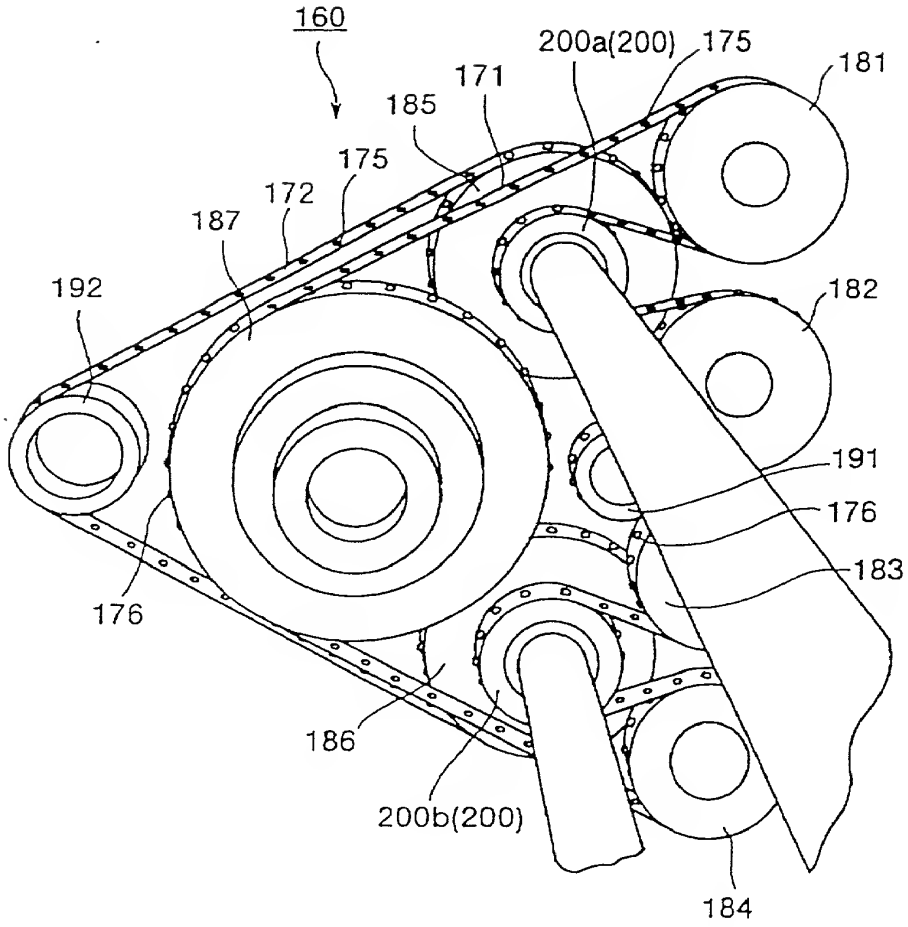

160
200a(200)
175
181
171
185
175
172
187
192
182
191
176
183
176
186
200b(200)
184

FIG. 20(a) ~~(a)~~

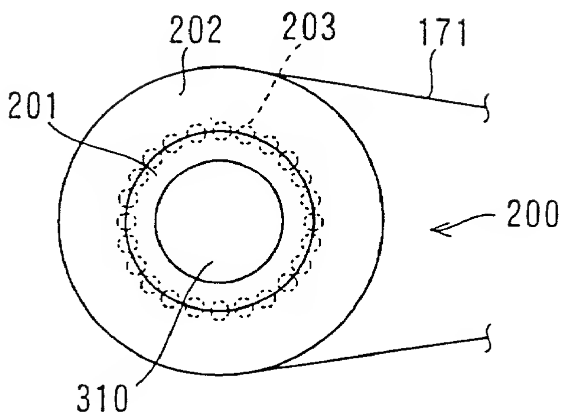
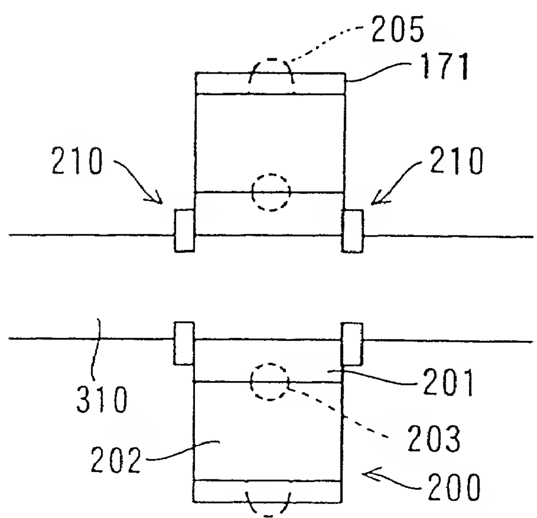


FIG. 20(b) ~~(b)~~



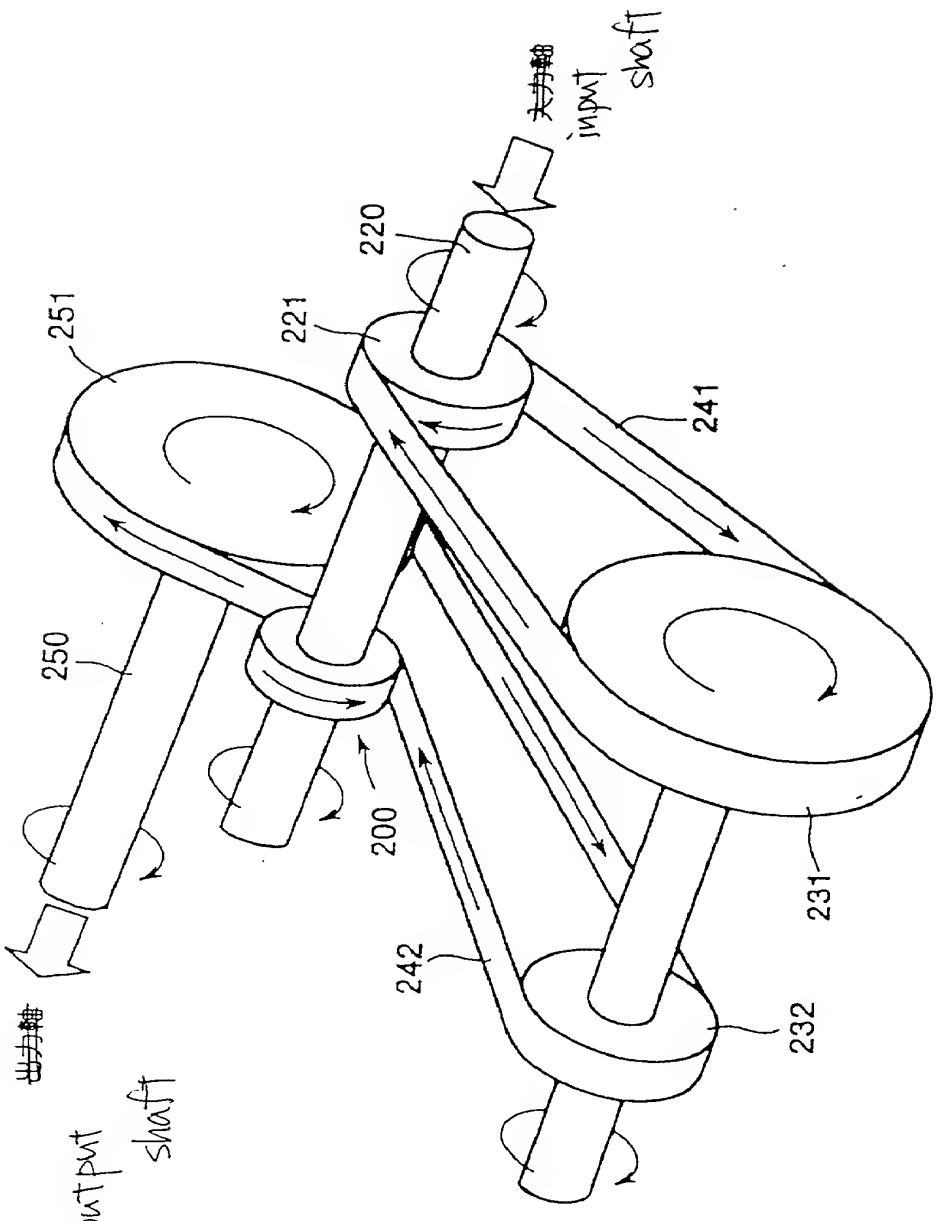


Fig. 21

FIG. 22 (a)

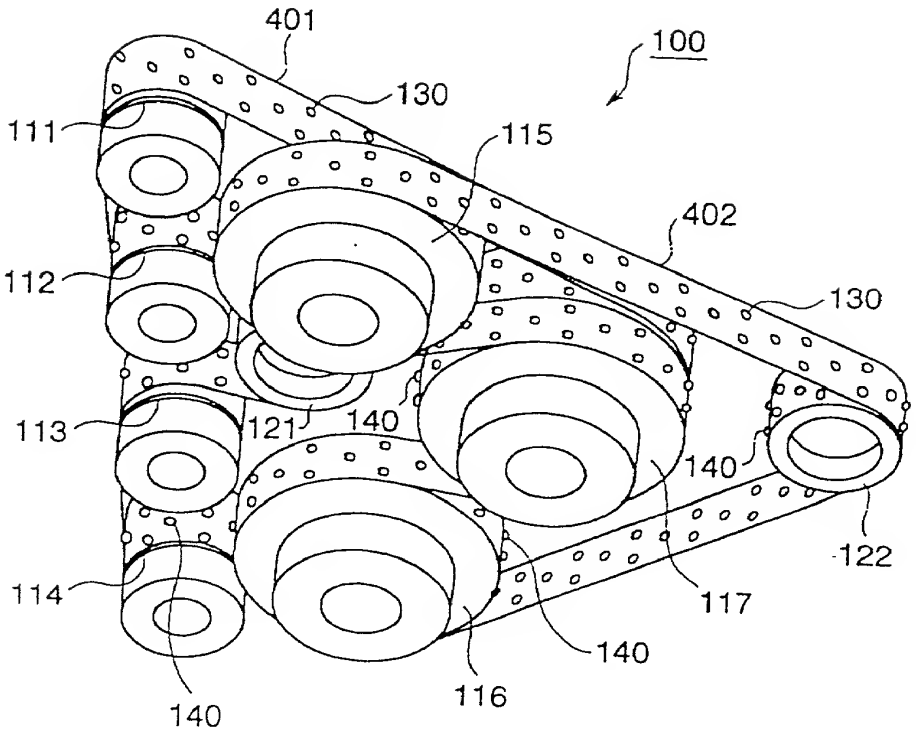


FIG. 22 (b)

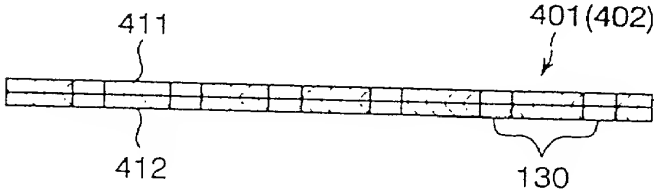


FIG. 23 (a)

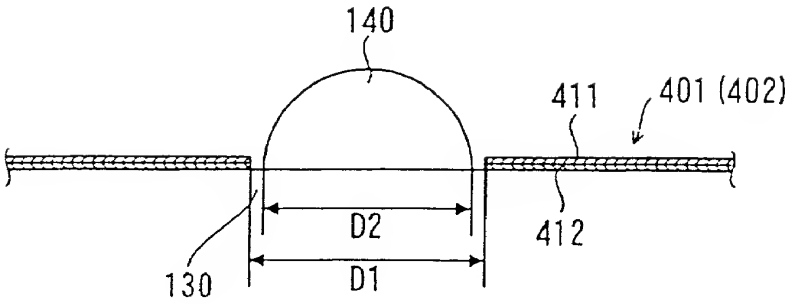


FIG. 23 (b)

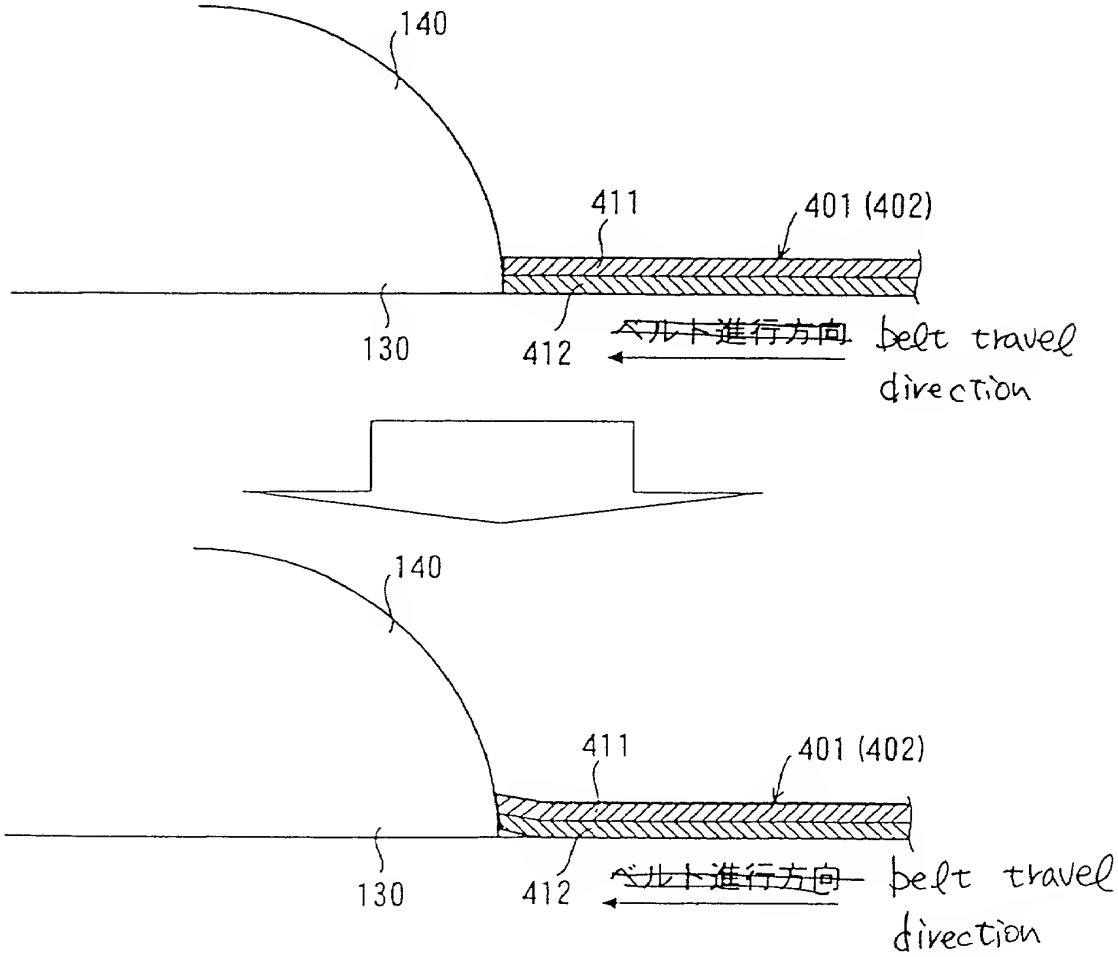


FIG. 24

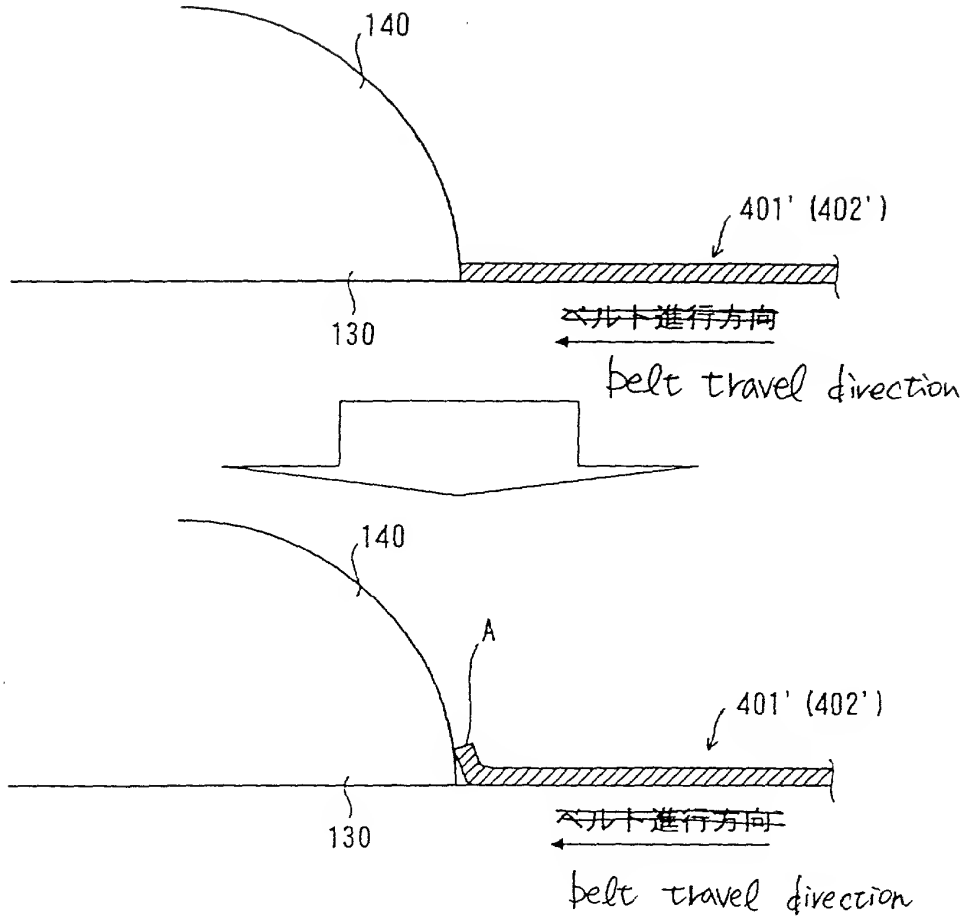
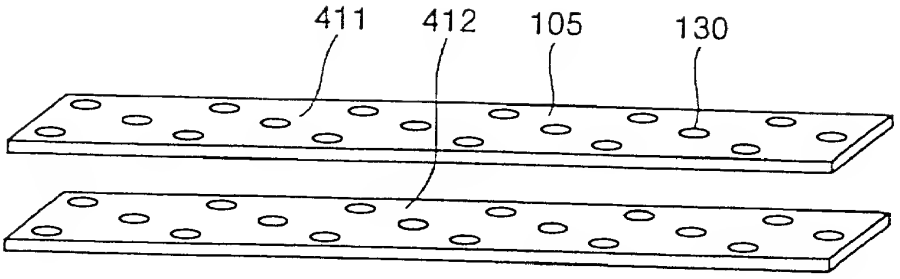
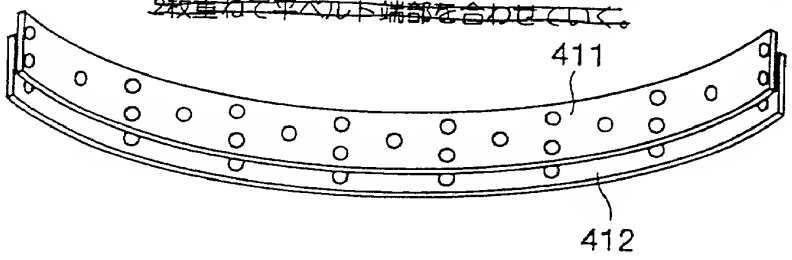

140
401' (402')
130
ベルト進行方向
belt travel direction
140
A
401' (402')
130
ベルト進行方向
belt travel direction

FIG. 25



overlap two sheets of flat belts with each other to align end portions thereof

2枚重ねに平ベルト端部を合わせる。



end portions of two overlapped flat belts is abutted and welded

2枚重ねに平ベルト端部を付き合わせ溶接する。

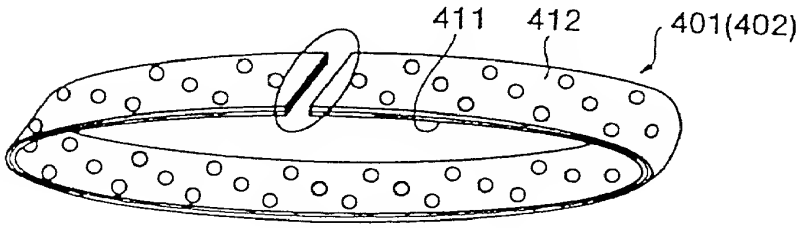
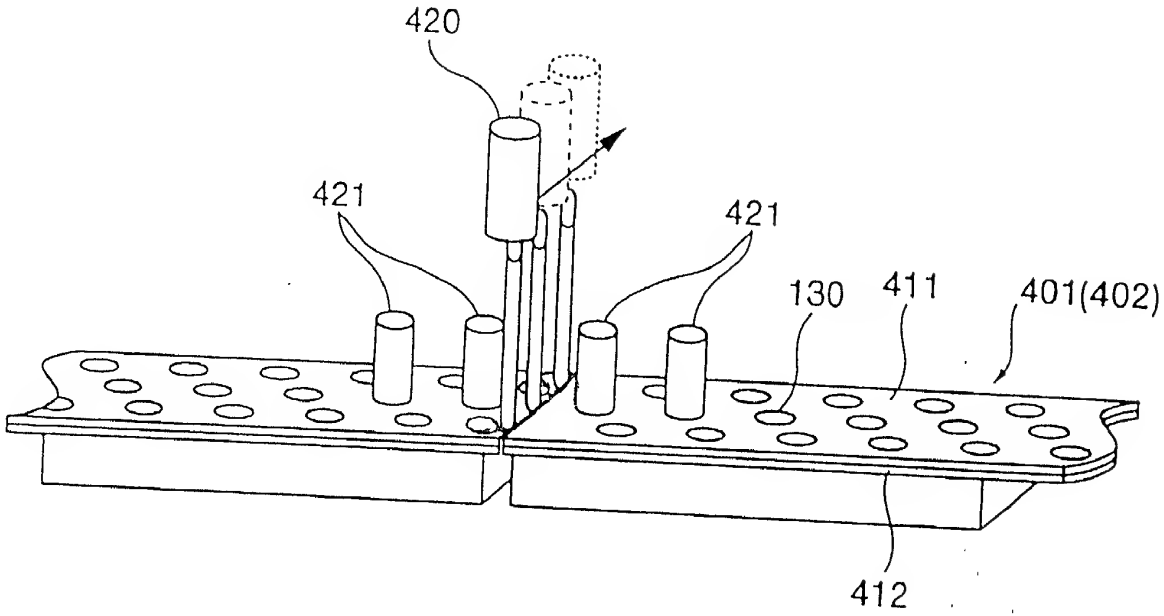


FIG. 26



27/34

FIG. 27

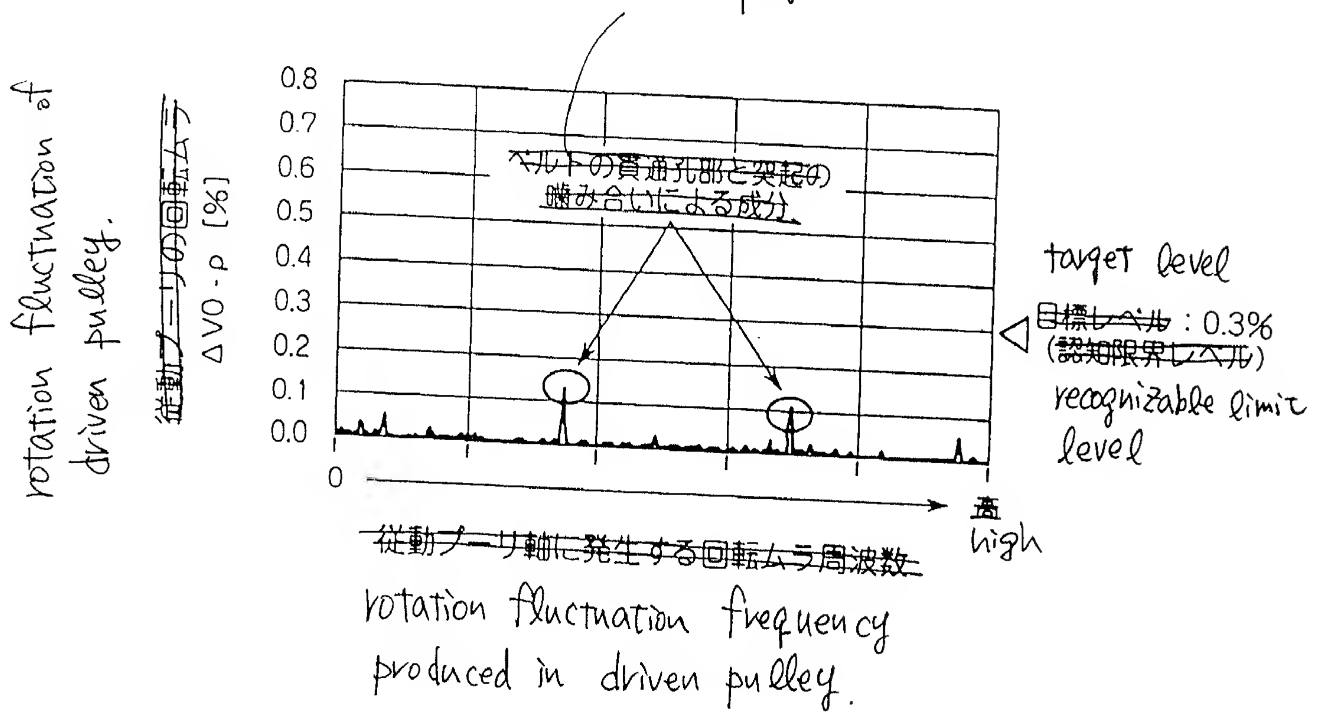
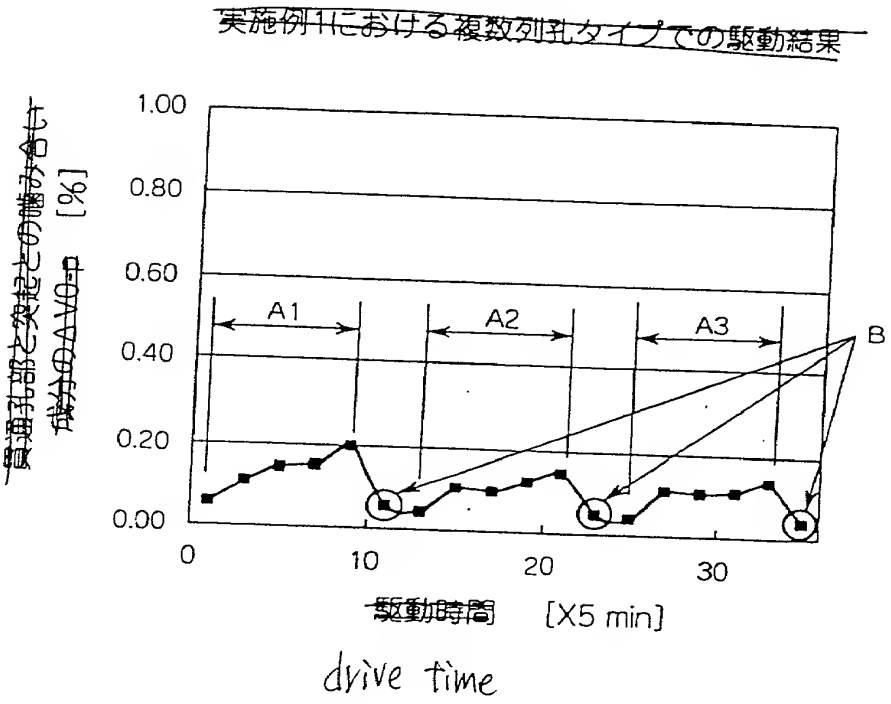

components produced from engagement between through hole portions of belt and projections
ベルトの貫通孔部と突起の噛み合いによる成分
rotation fluctuation of driven pulley.
従動プーリの回転ムラ
ΔVO-p [%]
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
target level
目標レベル : 0.3%
(認知限界レベル)
recognizable limit level
高
high
従動プーリ軸に発生する回転ムラ周波数
rotation fluctuation frequency produced in driven pulley.

FIG. 28

drive result in plural-column hole type in exaple 1



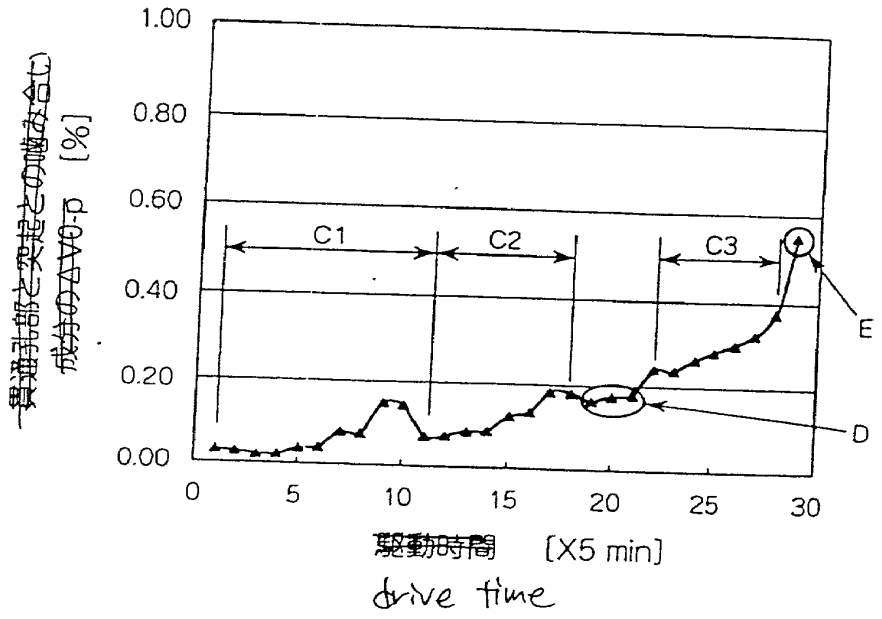
ΔV0-p of engagement component between through hole portions and projections

drive time

FIG. 29

drive result in coparative example
(one-column hole type)

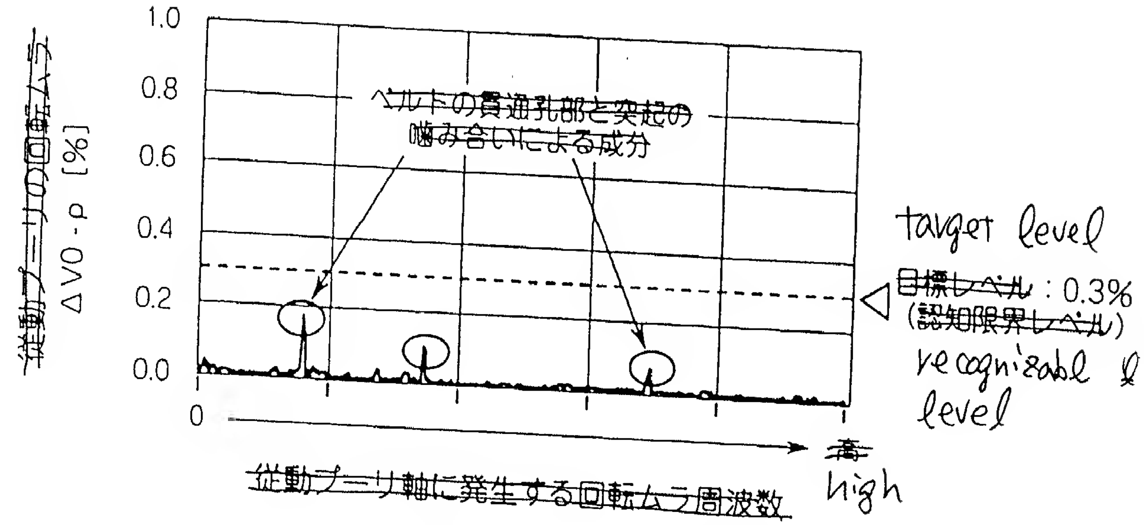
~~比較例(1列孔タイプ)での駆動結果~~



ΔV0-p of engagement component between through hole portions and projections

component produced from engagement between through hole portions of belt and projections

rotation fluctuation in driven pulley.



target level

recognizable limit level

high

rotation fluctuation frequency produced in driven pulley

FIG. 31

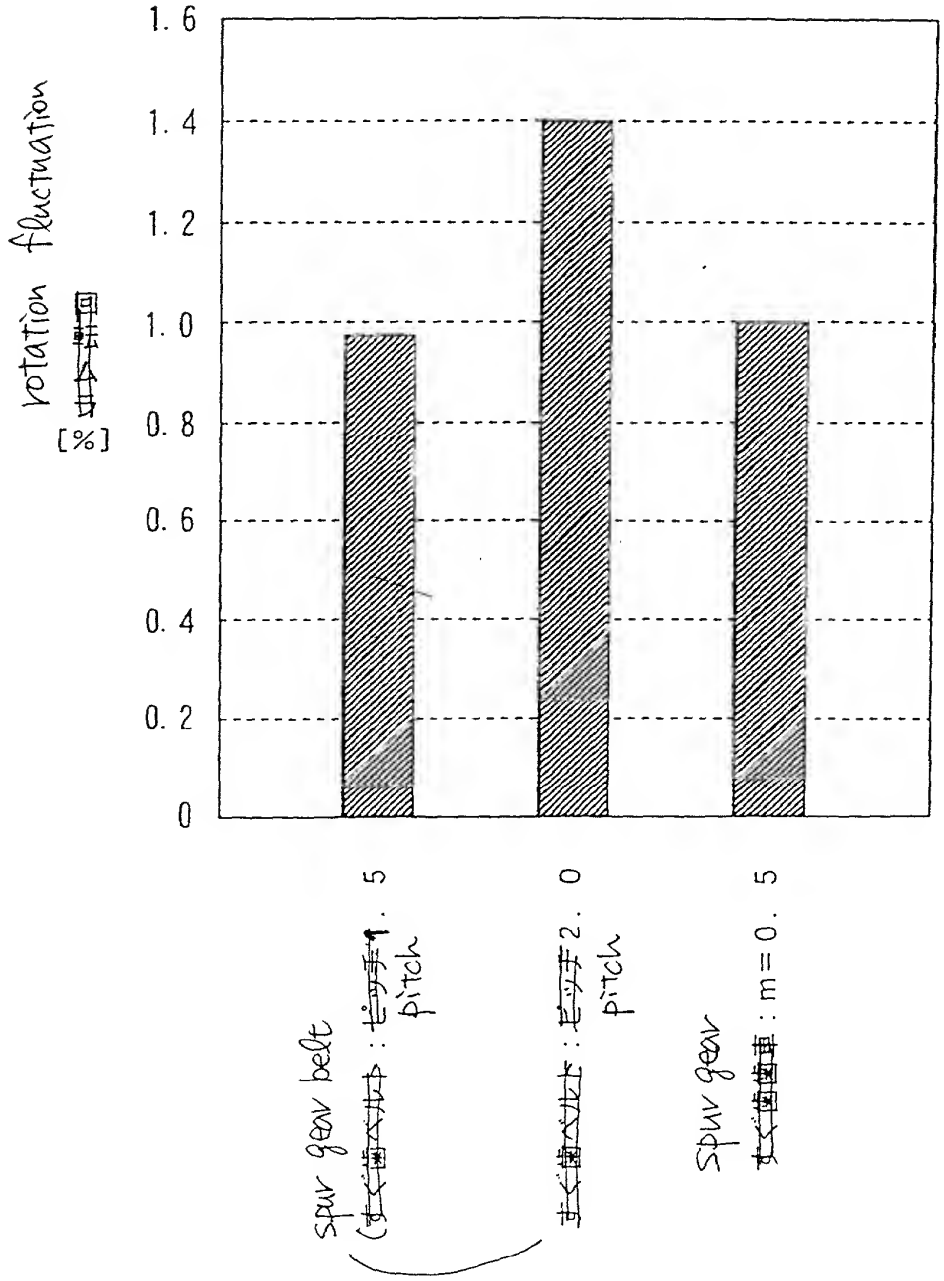

rotation fluctuation
回転変動
[%]
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
spur gear belt
(すぐ歯ベルト：ピッチ1.5
pitch
すぐ歯ベルト：ピッチ2.0
pitch
spur gear
すぐ歯歯車：m=0.5

FIG. 32

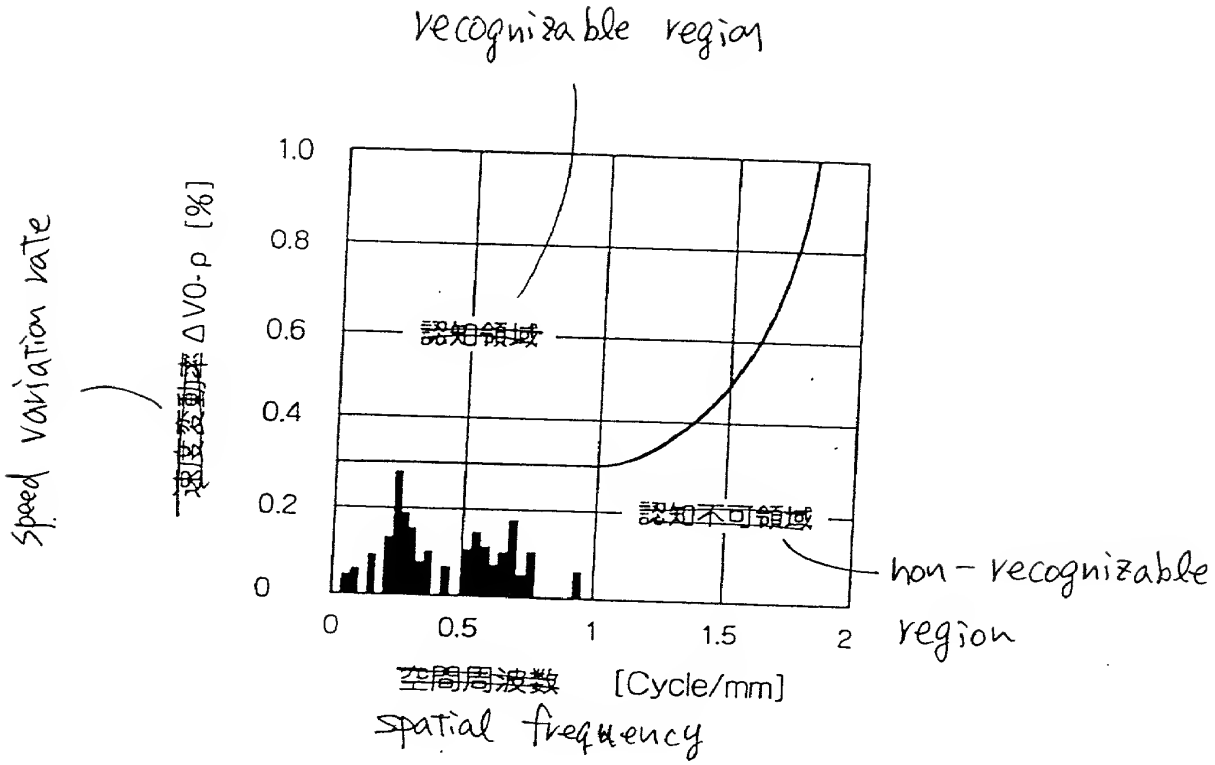

recognizable region
Speed variation rate
速度変動率 ΔV0-p [%]
1.0
0.8
0.6
0.4
0.2
0
認知領域
認知不可領域
non-recognizable region
0
0.5
1
1.5
2
空間周波数 [Cycle/mm]
spatial frequency

FIG. 33

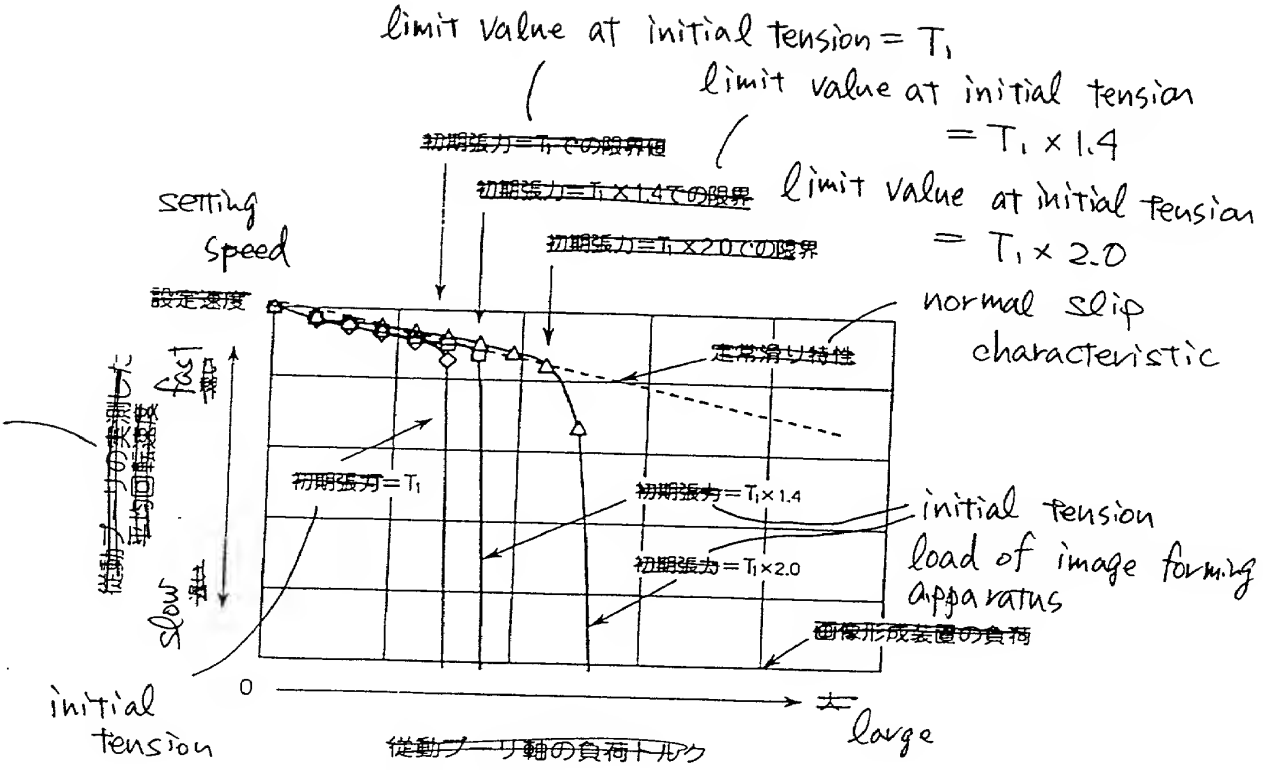

limit value at initial tension = T1
limit value at initial tension = T1 × 1.4
limit value at initial tension = T1 × 2.0
初期張力=T1での限界値
初期張力=T1×1.4での限界
初期張力=T1×2.0での限界
setting speed
設定速度
normal slip characteristic
定常滑り特性
fast
速い
slow
遅い
従動プーリの実際の平均回転速度
actually-measured average rotation speed of driven pulley
初期張力=T1
初期張力=T1×1.4
初期張力=T1×2.0
initial tension
load of image forming apparatus
画像形成装置の負荷
0
initial tension
大
large
従動プーリ軸の負荷トルク
load torque of driven pulley shaft

FIG. 34